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Well-Being and Psychological Consequences of Temporary Contracts: The Case of Younger Italian Employees

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Well-being and psychological consequences of temporary contracts: the case of younger Italian employees

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Abstract

Working conditions in Western countries have changed dramatically in the last twenty years, witnessing the emergence of new forms of employment contracts. The number of "standard" full-time permanent jobs has decreased, while non-standard work arrangements such as temporary, contingent or part-time contracts have become much more common. This paper analyses the impact of temporary contracts and job insecurity on well-being among younger Italian employees. We use the "Health Conditions and Use of the Health Service Survey" carried out by the Italian National Institute of Statistics in conjunction with the Bank of Italy's Survey on Households Income and Wealth (SHIW). We consider four dimensions of individual well-being: physical health, mental health, self-assessed health and happiness. To account for individual heterogeneity we match each temporary worker with a permanent worker using propensity score matching. Well-being of matched individuals is compared to estimates of the average effect of working with a temporary as opposed to a permanent contract. Our analysis reveals a negative relationship between psychological well-being, happiness and having a temporary job and is particularly marked for males.

JEL-Classification: I12, J08.

Keywords: health, happiness, psychological well-being, young employees, fixed-term contracts

1 Introduction

The spreading of temporary jobs is one of the most important innovations in the European labour market in the last decade. Even with some temporal lags and country-specific differences, labour market reforms in several European countries have progressively generated different types of flexible contracts such as seasonal jobs, fixed-term contracts, agency work and so on.

As with any other important innovation, liberalization of the labour market has generated an intense debate among academics and policy makers. On the one hand, temporary jobs contribute to a more flexible labour market, making firms more able to react to aggregate demand shocks; as a consequence, a positive effect of liberalization on employment rates is to be expected. On the other hand, it has been argued that temporary jobs may impact on workers' well-being (Blanchard and Landier, 2002). Indeed, while workers may prefer a flexible schedule to enjoy leisure, and a better programming of household tasks, a flexible and definitive duration of labour contract may represent a stress factor due to job insecurity with adverse consequences on individual welfare. Thus, the effect of flexible contracts on workers' well-being is essentially an empirical matter.

There exists a substantial literature that has tried to investigate the consequences of labour market contracts on individual well-being using several indicators such as job satisfaction, life satisfaction and health. With few exceptions, results seem to indicate adverse consequences of flexible contracts on all measures. The evidence base comes primarily from Western countries involved in liberalization processes but there is no evidence to date from Italy. Italy is an interesting case study since labour market reforms have changed the job market substantially creating a kind of parallel market where the passage from temporary contract to permanent one remains uncertain with no established path. Prior to the laws 196/97 and 368/2001 and in particular to the law n.30 of February 2003 "Government Delegation over Employment and the Job Market", commonly known as the Biagi Reform, Italy had fairly low levels of job insecurity: job contracts were essentially permanent with many restrictions around potentially firing workers. These reforms introduced progressively several new contractual forms with a high degree of flexibility both in working time and duration. The spreading of these types of contracts in Italy has been the highest in Europe over the period 1997-2008 (OECD, 2008) and it has involved mostly young workers.

This paper contributes to the literature by analyzing the physical and psychological consequences of flexible contracts on young Italian employees. Our study offers some unique perspectives relative to the literature in this field. First, we study the effects of non-permanent jobs on four measures of well-being: physical health, mental health, self-assessed health and happiness. Secondly, we shed light on some aspects of this relationship that have rarely been taken into account: the gender gap in the health consequences of non-permanent jobs and the link between this gap and household wealth.

In order to account for individual heterogeneity we match each temporary worker with a permanent worker on each characteristic known to be associated with employment condition and health (Caliendo & Kopeinig, 2008). We perform this matching using the Propensity Score (PS), as formalized by Rosenbaum and Rubin (1983). Well-being of matched individuals is then compared to estimates of the average effect of working with a temporary contract instead of a permanent contract.

The empirical investigation is performed using the cross-sectional survey "Health Conditions and Use of the Health Service" of the Italian population in 2004/05 in conjunction with the Bank of Italy's Survey on Household Income and Wealth (SHIW), which contains information on family income and wealth. The sample consists of young people between the ages of 15 (the minimum legal age to start

working in Italy in 2005) and 30. Consistent with previous literature, our analysis reveals a negative relationship between psychological well-being and having a temporary job (Robone et al. 2011). These effects are mainly driven by men. We further stratify our sample by those who receive financial support from their family and find strong differential effects by gender.

The remainder of the paper is organized as follows. Section 2 describes the institutional background, Section 3 surveys the related empirical literature on temporary contracts and health, while Section 4 introduces a model of health production. Section 5 describes the methods, Section 6 the data and Section 7 presents our results. Section 8 concludes with a discussion of our findings and some policy considerations.

2 Institutional setting

Working conditions in Western countries have changed radically in the last 20 years, witnessing the emergence of new forms of employment contracts. The number of "standard" full time permanent jobs has decreased, while non-standard work arrangements such as temporary work, contingent, part-time contracts, and unregulated work have become much more common (Waenerlund et al. 2011). From the beginning of the 1990s to 2010 the share of temporary employment in European countries has risen from 12 to 16 per cent (Eurostat 2011).

The Italian labour market too has changed significantly in the last decade. Following the guidelines of The European Employment Strategy, several reforms have been undertaken in Italy with the aim of introducing flexibility into the labour market. The foundations of this process have been the introduction and regulation of agency contracts and fixed-term contracts through Laws 196/97 and 368/2001. Agency contracts give firms the option of employing manpower hired by an agency on a temporary basis, while fixed-term contracts give the option of establishing a definite duration to labour contracts for technical and productive reasons. The most important reforms however, came from the 30/2003 law (also known as the Biagi Law) which impacted the labour market in three areas. The first was the introduction of five new forms of non-permanent contract: job-on-call, job sharing, part-time[1], apprenticeship training, and "collaborazione a progetto"[2]. The second aspect was the liberalization of public local agencies, namely agencies located at county level with the aim of matching job demand and supply. Thirdly, the 30/2003 law gave private agencies the option to supply work on a permanent basis (so-called staff-leasing).

The Biagi Law did not apply retrospectively to those already on permanent contracts and therefore had the biggest impact on new contracts which primarily affected young workers. As a consequence, in less than 7 years, the Italian labour market transformed from a system in which workers were employed quasi exclusively in a unique type of permanent job contract to a market with highly contractual forms of work with a much higher degree of flexibility both in working time and duration.

The adoption of non-permanent jobs was very fast. Between 1997 and 2008 the increment of the share of non-permanent jobs in Italy has been the highest in Europe (OECD, 2008). Young workers have been affected by the new contractual forms more than other kinds of workers. Figure 1 shows the evolution of permanent and non-permanent employment in Italy by age groups from 1993 to 2008. Temporary employment increased for all age categories, but while permanent employment strongly declined for workers aged 15-24 (panel a), it has been constant for workers aged 25-54 (panel b) and increased for workers aged 55-64 (panel c). Thus, for workers aged 15-24 permanent employment was approximately equal to non-permanent employment in 2008. Especially since 2003, new job opportunities for young workers in Italy have been almost exclusively limited to the new forms of non-permanent jobs.

[1]Part-time contracts existed before the Biagi law. However the latter modified its regulation introducing high flexibility of working hours.

[2]This refers to a labour contract usually linked to the realization of a project or part of it.

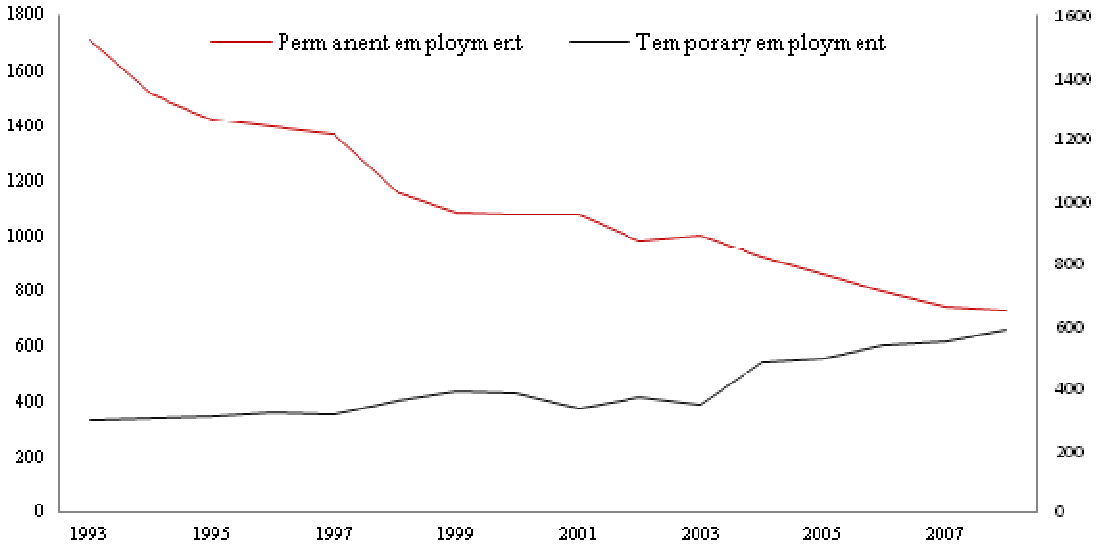

Figure 1(a): Temporary and permanent employment by age group 15-24, 1993-2008

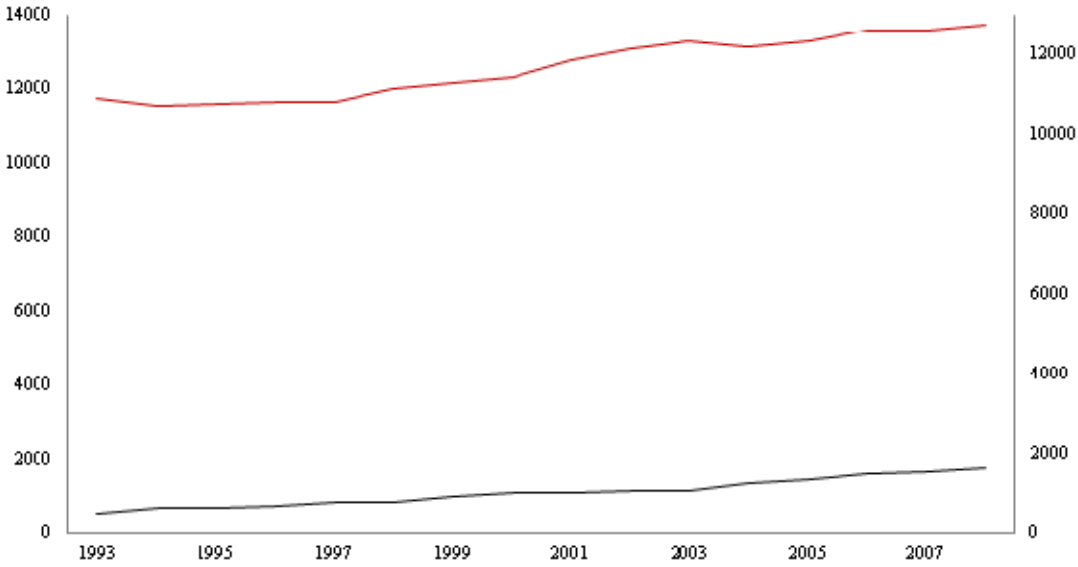

Figure 1(b): Temporary and permanent employment by age group 25-54, 1993-2008

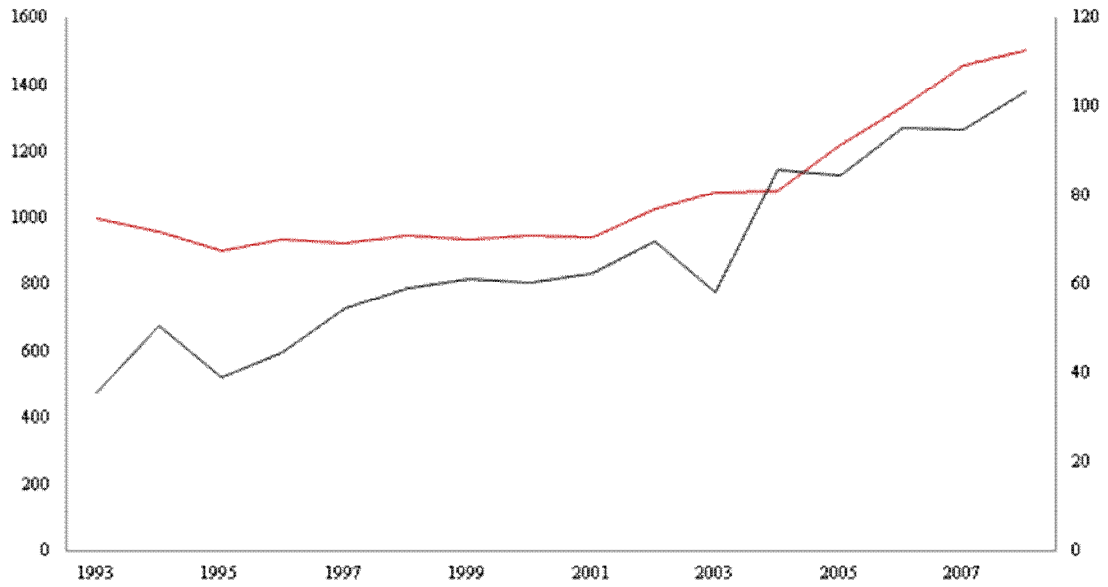

Figure 1(c): Temporary and permanent employment by age group 55-64, 1993-2008

Notes: Left Vertical Axis refers to permanent employment, Right Vertical Axis to refers to temporary employment. Figures are in Thousands. Source: OECD (2008)

Many features of the Italian liberalization process are common to the reforms occurring in other European countries such as Spain and France. However, due to certain characteristics of the Italian institutional setting, labour market and welfare system, the impact of the labour reform on Italian society has been particularly acute. First, the adoption of non-permanent positions in Italy has been more rapid: no other country in Europe had a comparable growth rate of temporary contracts. Second, on average, the jobs characterized by the new contractual forms are paid less well than traditional ones. This wage policy has been adopted by firms in many European countries (Bentolila and Dolado 1994; Hagen, 2002), but is particularly common in Italy (Elia, 2010). Third, there is evidence that in Italy after the end of a contract, an employee with a temporary contract is more likely to be hired with another temporary contract, or to become unemployed, than to be hired with a permanent contract (Ichino and Riphahn, 2005; Garibaldi and Pacelli, 2008). Lastly, welfare safety nets for non-permanent workers are not particularly strong in Italy for two reasons. On one hand, in Italy there are no transfers to support in-work poverty which is much more common among workers with fixed-term contracts (Di Bartolomeo et al. 2009). On the other hand, unemployment is more costly for individuals than in other European countries because unemployment benefits are generally very low[3]. For these reasons we expect that recent Italian labour market changes have had an impact on young workers' physical and psychological health.

[3]The maximum benefit recognized is 60% of the last wage and covers a period of 8 months for individuals under the age of 50 and 12 months for individuals over 50.

3 Previous evidence on temporary contracts and health

The empirical evidence regarding the effects of temporary versus permanent contracts on health is mixed. Some studies report that workers with fixed-term contracts have worse physical health than workers with permanent contracts. Referring to mortality, a variable which has been shown to be strongly predicted by self-reported health (Idler and Benyamini, 1997), Kivimaki et al. (2003) show that among respondents to the Town Study (Finland), temporary employment is associated with an increase in all cause mortality and death from alcohol related causes and smoking related cancer. On the other hand, a move from temporary to permanent employment is associated with a lower risk of mortality. Gash et al. (2007) consider Spanish data from the European Community Household Panel and German data from the German Socioeconomic panel. They show that when unemployed people find a job, the health improvement they obtain is lower if the job is a fixed-term rather than a permanent one. Waenerlund et al. (2011) use a sub-sample of the Northern Swedish Cohort and they show a negative association between temporary employment and health status (this association appears to be driven in particular by low cash margin and job insecurity).

In other studies, fixed-term contracts have been shown to have no effects, or even positive ones, on health. When considering Finnish data, Virtanen et al. (2003) suggest that no difference in health indicators exists between the employees with fixed-term contracts and those with permanent ones while Sverke et al. (2000), when considering workers in a Swedish hospital, report that having a fixed-term contract has a positive effect on physical health compared to having a permanent one. More recently, Ehlert and Schaffner (2011) have taken into consideration a panel dataset (2004-2008) comprising 27 European countries. Most employees with a permanent contract do not appear to report better health than those with a temporary contract; however repeated temporary contracts show a significant negative impact on self assessed health.

With respect to psychological well-being, fixed-term employment is traditionally assumed to affect this health dimension negatively. Fixed-term contracts are considered stressful since they imply job insecurity (Burchell 1994, 1999, Bohle et al. 2001), not enabling workers to plan and control their lives given the short-term nature of their jobs (Burchell 1994)[4]. This traditional assumption is confirmed by several studies. Lasfargues et al. (1999), using French data, show that workers with a temporary contract report lower psychological well-being than those with a permanent one (similar results are reported by Klein et al. 1999). Quesnel-Vallee et al (2010) perform a propensity score analysis, adopting an approach very similar to the one used in our study. They use prospective data from the US National Longitudinal Survey of Youth 1979, which follows from 1979 to 2010 a national representative cohort of American men and women. They find a significant negative effect of temporary work on mental health for those who had been exposed to temporary work in the two years preceding the outcome measurement. It is unlikely, however, that fixed-term contracts have the same impact on all workers. Characteristics at individual level, such as tolerance for ambiguity and self-monitoring, play a relevant role in influencing responses to stress and the selection process into permanent employment (Bauer and Truxillo, 2000).

Therefore, it is not surprising to find studies in the literature not supporting the traditional assumption of the negative impact of fixed-term employment on psychological well-being. Sverke et al. (2000), for instance, report no differences in psychological well-being between workers with fixed-term and permanent contracts. Similar results are reported by Cottini and Lucifora (2010) when performing a panel data analysis based on three waves of the European Working Conditions Survey (EWCS), which comprises 15 European countries.

[4]For instance, there is evidence that having a non-permanent job is associated with non-partnership formation (Artazcoz et al., 2005).

In general, recent evidence appears to suggest that workers with fixed-term contracts cannot be considered as a homogeneous group when comparing their health and well-being with that of workers with permanent ones. Silla et al. (2005) consider a sample of Spanish workers with a temporary contract and they stratify them according to preferences for contract and level of employability. "Traditional" temporary workers (with low employability or a low prospect of finding another job and a low preference for temporary contract) have lower well-being than permanent workers, but the rest of temporary workers report higher well-being than permanent ones. Natti et al. (2009) investigate the relationship between the type of employment contract and mortality using a panel dataset of Finnish employees. Their results show that only those temporary employees who either felt the insecure situation unsatisfactory or who worked in temporary work involuntarily had a higher risk of mortality than permanent employees. Robone et al. (2011) investigate the influence that contractual conditions have on self-assessed health and psychological well-being of employees using twelve waves of the British Household Panel Survey. Their analysis reveals a negative relationship between health and psychological well-being and having a fixed-term contract, compared to having a permanent one. However, as shown by Silla et al. (2005), having a high level of employability (in this study proxied by higher education levels) appears to positively influence both health and psychological well-being of individuals with temporary job arrangements.

In the literature investigating the links between labour conditions and "happiness", several studies have shown a large negative effect of unemployment on individual happiness (Frey and Stutzer 2000, Lucas et al. 2004, Ferrer-i-Carbonell & Gowdy 2007). However, very little evidence has been reported about the influence of contractual conditions on happiness (Dolan et al. 2008). Scherer (2009) uses the 2004 ESS data, which involves 16 western European countries. She reports employees with temporary contracts to be less likely to have a high level of life-satisfaction and happiness. Ponzo (2011) investigates the determinants of individual subjective well-being in Italy using the 2004, 2006 and 2008 waves of the Bank of Italy Survey on Household Income and Wealth (SHIW) and suggests that the reported level of happiness is lower for workers with fixed-term contracts. Given the amount of time people spend at work, the limited evidence suggests the relationship between working conditions and happiness requires more investigation (Dolan et al. 2008).

4 Temporary contracts and health production

We provide a theoretical framework for the relationship between atypical employment contracts and individuals' health as proposed by Robone, et al. (2011) which includes working conditions as a health enhancing input in the model for the demand for health developed by Grossman (1972). In the Grossman model, health is considered a durable "capital stock" that produces an outcome of healthy time which has a direct and positive effect on utility (a consumption aspect) and increases real wages and wealth (an investment aspect). We focus only on the pure consumption model, thus ignoring the effect of healthy time on real wage increases.

According to the Grossman model the variation in health for an individual between time t and $t+1$ can be expressed as:

$$\Delta H_t = H_{t+1} - H_t = I_t - \delta_t H_t \qquad (1)$$

where H_t is the health stock at time t, I_t is the investment in health at time t and δ_t is the natural rate at which health deteriorates. Thus, health capital depreciates over time but individuals can increase health capital by investing in health-enhancing activities. A natural candidate for this investment is medical care which improves health (assuming it is totally effective) and any time investment in health-promoting activities, such as physical activity, stopping smoking, reducing drinking, following a healthy diet, recreation and so on. Thus, individuals' investment in health can be captured by the following household production function:

$$I_t = I_t(M_t, TH_t, Z_t, e_t) \qquad (2)$$

where: M_t is medical care, TH_t is the time invested by the individual in health promoting activities, and Z_t is any other personal characteristics which have an influence on the investment in health. In the original Grossman model, education is considered the main personal characteristic influencing health for both allocative and technical efficiency. Better educated individuals are assumed to choose health care inputs more efficiently because of a greater awareness of health risks and because they might more easily understand and follow the advice of health care providers. In this framework we also include gender, marital status and other individual characteristics (see the empirical section for more details). Individuals also have other unobservable factors e_t which may influence investment in health such as genetic endowment. Substituting equation (2) in (1) yields:

$$\Delta H_t = H_{t+1} - H_t = I_t(M_t, TH_t, Z_t, e_t) - \delta_t H_t \qquad (3)$$

Following Robone, et al. (2011), we assume that working conditions may be considered as a potential input into the health production function. In particular, we assume that job related health stress may influence individual health status. This assumption is easily justified by the empirical evidence about the impact of working and contractual conditions on health (see section 3). In order to introduce the impact of "job-related health stress", our analysis assumes changes in working conditions to influence the rate at which an individual's stock of health depreciates:

$$\delta_t = \delta_0 \left(1 + \tilde{\delta}\right)^t \Psi_t^{\phi} \qquad (4)$$

Following Grossman (1972) and Galama and Van Kippersluis (2010) we assume that health depreciates over time at an increasing rate with age ($\tilde{\delta}$) and with job-related health stress to which

an individual is exposed (Ψ). Job-related health stress directly enters the rate of decay and physically alters the state of a person's health; its magnitude is measured by ϕ. Here we concentrate on a particular aspect of job-related stress which relates to the security of the job and we assume that job-related stress is associated with fixed-term or non-permanent labour contracts. Therefore the magnitude of job-related stress differs between individuals in permanent versus temporary positions. We don't need to assume that job security decreases stress, as it is also possible that individuals are better off with less security. This is ultimately an empirical matter.

Our research question is related primarily to estimating the differences in health between individuals enrolled in permanent versus temporary jobs, namely $H_{t+1}^{T} - H_{t+1}^{P}$. Our model of health production is dynamic to show the theoretical relationship between individuals' job-related stress and their rate of health deterioration due to non-permanent labour contracts. Equation (3) suggests that health differentials between permanent and temporary workers are explained by differences in the natural rate at which health deteriorates. While we have cross-sectional data, we use a measure of past health (past activity-limiting injuries to capture health status at the beginning of the observation period) and demographic observables which are related to health stock, such as age, gender, and having a child. The measure of health stock can be considered as H_t while the health outcomes we measure (self-assessed health, happiness, physical and psychological well-being) can be considered as H_{t+1}. Thus, the empirical strategy we adopt consists of simulating a counterfactual in which individuals are matched according to M_t, TH_t, Z_t characteristics included in equation (2) and according to health stock H_t in equation (3). This allows us to control for all characteristics which are considered as important predictors of health. Thus we control for the health stock of individuals and other covariates (through the matching procedure). The remaining difference in current health and well-being is thus related to having a non-permanent labour contract which is the result of having a different health depreciation rate.

5 Methods

From a methodological point of view, it should be noted that workers with a temporary contract may differ substantially from workers with a permanent one in several ways; for instance, temporary workers may be selected into temporary jobs as a result of pre-existing poor health conditions. This potential endogeneity problem can be corrected by matching each temporary worker with a permanent worker on each characteristic known to be associated with employment condition and health (Caliendo & Kopeinig, 2008). In our analysis we performed this matching by using Propensity Score (PS) matching, as formalized by Rosenbaum and Rubin (1983).

Analytically, this method calculates an index $e(X)$ for each worker, as a function of confounders (X) and represents the conditional probability of being a temporary worker, given all observable individual characteristics:

$$e(X) = P(I = 1 | X) \qquad (5)$$

where $I = 1$ denotes that the individual belongs to the temporary worker group (or the "exposed / treated" group). The PS can be considered as a balancing score, meaning that among subjects with the same propensity to be exposed, treatment is conditionally independent of the covariates. We invoke the common support modelling option which restricts the set of data points over which the test of the balancing property is sought to those belonging to the intersection of the supports of the propensity score of treated and controls. Imposing the common support condition in the estimation of the propensity score may improve the quality of the matching process.

We first compute the propensity score through a probit model[5]. The dependent variable is a dummy indicator for the type of contract that equals 0 if the individual has a permanent contract and 1 if he/she has a temporary one. The reference individual in the model is male, lives in the South of Italy and is married with children. He is aged fifteen years old or more, is a blue collar worker in the primary industry and has a secondary school certificate.

Secondly the matching is carried out through algorithms which form "statistical twins" that differ only in their contract status and not in other observed characteristics in order to account for self-selection. Thus, for a given propensity score, exposure to treatment is effectively random and treatment and control groups should on average be observationally identical. We test the robustness of our results by performing the matching with different algorithms. We perform the matching through the Nearest Neighbour, Radius (with the size of caliper 0.1) and Kernel Matching technique (see, e.g., Caliendo and Kopeinig, 2008 and Imbens and Wooldridge, 2009, for recent overviews). These different matching algorithms will result in different match samples and therefore different sample sizes for the treated and control groups.

Finally, health and well-being of matched individuals is then compared to estimate the average effect of working with a temporary contract instead of a permanent contract. Specifically, we are interested in the average effect of the treatment on the treated (ATT) i.e. the difference between the health outcomes for workers with temporary jobs with respect to the counterfactual unobservable outcome which would have prevailed for them if they had a permanent job.

All analyses are carried out on the full sample and separately by gender to account for the pronounced differences in labour market attachment between women and men.

[5]The estimation was carried out using the PSCORE program for STATA developed by Becker and Ichino (2002).

6 Data

The empirical investigation uses the cross-sectional survey "Health Conditions and Use of the Health Service" (ISTAT Multiscopo Survey, 2007) of the Italian population in 2004/05. This is matched to the Bank of Italy's Survey on Household Income and Wealth (SHIW) 2004, which contains information on family income and wealth. The matching procedure used for linking the two datasets is provided in the Appendix.

The analysis was conducted on the sub-sample of employed individuals only. We also restricted our sample to young people between the ages of 15 (the minimum legal age to start working in Italy in 2005) and 30. After deleting records with missing values, we obtained a final sample of 8280 observations. The sample was stratified into workers with a permanent or temporary contract; 1840 workers (22%) had temporary jobs. In the ISTAT Multiscopo survey temporary employment is defined as work that has a predetermined end date or will end as soon as a specific project is completed. The data covers only full-time employment (on a permanent or temporary contract) and not part-time employment.

In our analysis we use four dependent variables of health status: self-assessed health (SAH), the Physical Component Score (PCS) and the Mental Component Score (MCS) from the Health Related Quality of Life instrument Short Form (SF-12), and an indicator of happiness. A description of the health status of workers with a permanent and temporary contract is provided in Table 1. Percentage distributions for each of the four health-related measures are presented separately for each category of worker.

Table 1: Descriptive statistics of the health variables

	Full Sample		Temporary Job		Permanent Job	
Variables	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Self-Assessed Health	4.21715	0.669	4.207	0.676	4.22	0.667
SF12 Physical Health	54.478	5.139	54.494	5.356	54.473	5.075
SF12 Mental Health	52.31	8.139	51.784	8.127	52.461	8.136
Happiness	4.523	0.577	4.48	0.614	4.535	0.566
N	8280		1840		6440	

The following standard self-assessed health (SAH) status question was asked: "Would you say that in general your health is: excellent, very good, good, fair, poor". SAH was therefore measured on a five-point scale from 'excellent' (score 5) to 'poor' (score 1) and was treated as an ordered categorical variable. The use of SAH as an indicator of health status is supported by evidence which shows a strong predictive relationship between people's self-rating of health and mortality or morbidity (Idler and Benyamini, 1997; Kennedy et al., 1998). Moreover, SAH correlates strongly with more complex health indices such as functional ability or indicators derived from health service use (Undon and Elofsson, 2006).

The PCS and MCS were obtained from the SF-12. The SF-12 is a multipurpose short form survey with 12 questions, all selected from a longer instrument, the SF-36 health survey introduced in the United States during the 1980s (Ware et al., 1996). The SF-12 is a generic measure and does not target a specific age or disease group. It has been developed to provide a shorter, yet valid alternative to the SF-36, which has been seen by many health researchers as too long to administer when dealing with large samples. The SF-12 is weighted and summed to provide easily interpretable scales for physical and mental health. The PCS and MCS were computed using the scores of the twelve questions and varied from 19.47 to 68.4 and from 8.54 to 68.7 respectively; better psycho-physical health corresponds to higher values). Very low scores (under 20) on PCS correspond to "substantial

limitations in taking care of oneself and in physical, social and personal activity; important physical pain; frequent tiredness; health is considered as poor". A low value on MCS indicates "frequent mental trouble; important social and personal trouble due to emotional problems; health is considered as poor".

The indicator of happiness which we consider in our analysis is measured by the following question: "Would you describe yourself as being: happy and interested in life; somewhat happy; somewhat unhappy; very unhappy; so unhappy that life is not worthwhile". The individual's personal happiness is rated on a five-point scale from "happy and interested in life" (score 5) to "so unhappy that life is not worthwhile" (score 1) and it is treated as an ordered categorical variable. General happiness is a measure of subjective well-being which has been examined extensively in the literature (George, 2006; Veenhoven, 1996). Studies consistently show a strong relationship between happiness and both physical and psychological health (Dolan et al. 2008; Graham, 2008). Psychological health appears to be more highly correlated with happiness than physical health (see Table 2), but this is not surprising given the close correspondence between psychological health and happiness.

Table 2: Correlation coefficients of the health variables

	Self-Assessed Health	SF12 Physical Health	SF12 Mental Health	Happiness
Self-Assessed Health	1			
SF12 Physical Health	0.4326	1		
SF12 Mental Health	0.361	-0.0633	1	
Happiness	0.266	0.0652	0.3749	1

Potential confounding factors which could be associated with both health and employment conditions include age, gender, education, marital status, family composition, industry and occupation, work experience, individual income, geographical region, and past activity-limiting injuries (introduced in order to capture health stock at the beginning of the observation period). The independent variables in the model are listed, together with the health status and happiness variables, in Table 3.

Age was modeled as a continuous variable. Marital status was categorized into never, currently, or previously married. Household types were defined with reference to the family nucleus. These were defined as a partnered couple (married or cohabiting) with or without children, or a sole parent with one or more children. Activity-limiting injuries is a binary variable that takes the value one if respondents reported that they suffered injuries in the previous six months which were serious enough to limit their normal activities, zero otherwise.

The International standard classification of education (Isced) was used to classify the education variable. Isced is classified into 6 levels: Isced 0 (pre-primary schooling); Isced 1 (primary education); Isced 2 (lower secondary); Isced 3 (upper secondary); Isced 4 (post high school); Isced 5 (university); Isced 6 (post graduate). In the analysis Isced levels 1 and 2, and 5 and 6 have been grouped together, respectively. Four levels of education are therefore considered: 1) no educational certificates or primary school certificate; 2) lower high school certificate; 3) high school graduation; 4) university degree or postgraduate.

Based on the nature of products, industries were categorized into primary (agriculture), secondary (manufacture, construction), or tertiary (accommodation, restaurants, transport, communication, real estate, business services, schools, finance, insurance, data processing, law, health care).

Table 3: Definition of variables used in the propensity score model

Variable Name	Variable Definition
Outcome Variables	
Self-assessed health	1 if "poor", 2 if "fair", 3 if "good", 4 if "very good", 5 if "excellent" health
Happiness	1 "so unhappy that life is not worthwhile" to 5 "happy and interested in life"
PCS	Physical Component Score - Health Related Quality of Life instrument Short Form
MCS	Mental Component Score - Health Related Quality of Life instrument Short Form
Controls	
Age	age in years at 1st December of current wave
Female	1 if female, 0 otherwise
Education	
Primary school	1 if no educational certificates or if primary school certificate, 0 otherwise
Lower high school	1 if lower high school certificate, 0 otherwise
High school	1 if high school certificate, 0 otherwise
University or postgraduate	1 if university or postgraduate degree, 0 otherwise
Marital Status and Family Composition	
Married	1 if currently married, 0 otherwise
Previously married	1 if previously married, 0 otherwise
Never married	1 if never married, 0 otherwise
Partnered couple with children	1 if married or cohabiting with children, 0 otherwise
Partnered couple without children	1 if married or cohabiting without children, 0 otherwise
Single parent	1 if single parent with children, 0 otherwise
No family unit	1 if no family unit, 0 otherwise
Industries and Occupation and Income	
Primary industry	1 if primary (agriculture), 0 otherwise
Secondary industry	1 if secondary (manufacture, construction), 0 otherwise
Tertiary industry	1 if tertiary (accommodation, restaurants, transport etc.), 0 otherwise
Business executive	1 if business executive, 0 otherwise
Supervisor	1 if supervisor and intermediate decision posts, 0 otherwise
White collar	1 if white collar, 0 otherwise
Blue collar	1 if blue collar, 0 otherwise
Work experience	1 if more than ten years of working experience, 0 otherwise
Income	log of annual labour income (in Euros)
Macro-regions	
North	1 if North, 0 otherwise
Centre	1 if Centre, 0 otherwise
South	1 if South, 0 otherwise
Islands	1 if Islands, 0 otherwise
Past Health Status	
Injuries	1 if injuries in the previous six months serious enough to limit normal activities, 0 otherwise
Stratifying Variable	
Financial support by family	1 if receive financial support by the family, 0 otherwise

Occupations were categorized into four groups: business executive and assimilated, supervisor and intermediate decision posts, white-collar and blue-collar workers. Work experience was measured with a binary indicator that takes the value one if respondents have more than ten years of working

experience, zero otherwise[6]. Income was log-transformed to obtain a normal distribution and modeled as a continuous variable.

We also use a variable on individuals who receive financial support from their families. We do not include this as a covariate, but use it to further stratify our sample to examine differences between individuals who rely on employment versus those who rely on family support as their main source of income. While we do not know the magnitude of family support, we are able to use this binary variable for whether they received any support at all, to further disentangle the impact of contract status on health. Both cultural factors, but particularly in more recent years, economic factors, have played a key role in observing late transitions into adulthood in Italy. The Italian labour market is characterized by a persistently high youth unemployment rate so that a number of school-leavers and graduates are unemployed for quite some time after leaving initial education, and even those who do find a job immediately, frequently have a flexible and insecure labour market position. Over recent years people's belief in being able to hold on to their jobs has been shaken. The lack of job security prevents any forward planning in particular amongst young people who have come to the end of a training period and for whom work represents a central factor in their lives (Lewiss et al., 1999). Due to the job insecurity and weak welfare system that does not offer financial support to young people, many young Italian workers tend to depend on their parents, even at ages at which their European counterparts have generally managed to achieve an independent lifestyle (Schröder, 2008). According to the Italian Statistical Office[7] the median age for leaving home for Italian males is about 27 years old.

Table 4 presents summary statistics for all the demographic and socio-economic factors in the final sample. As shown in Table 4, women are more likely to have a temporary contract than men. Table 4 shows that being young, single, having a high education, having less work experience and living in the South or Island regions are characteristics associated with having a temporary contract. We also see that those on temporary contracts are more likely to receive financial support from their families.

Labor market conditions may be very different among Italian regions because of the economic and social dualism between the more economically developed Northern regions and the less developed Southern ones. Southern Italy is Europe's principal empirical case study of failed modernization (Chubb, 1982; Davis and Marino, 2000; Micali, 2009); it is often used by researchers as a case study for corruption and crime and as case study for underdevelopment (Davis and Marino, 2000). Therefore, we control for the local labour market context using a set of geographical dummies. We refer to macro-regions and consider North, Centre, South and Islands. Table 5 shows differences in socio-economic contexts among different Italian macro-regions. In Table 5 income is stratified into quintile groups based on the income distribution for the total sample; percentage distributions for each quintile are presented separately by macro-region and reiterate that temporary jobs and lower incomes tend to be clustered in the South and Island regions.

[6] We tested shorter intervals for work experience such as 2 or 3 years but these were not significant.
[7] Famiglia e Soggetti Sociali, ISTAT, 2003

Table 4: Descriptive statstics of variables in the propensity score model

Variables	Full Sample		Temporary Job		Permanent Job	
	Mean	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Age	26.424	3.489	25.485	3.66	26.693	3.392
Female	0.4306	0.495	0.484	0.499	0.415	0.493
Education						
Primary school	0.032	0.175	0.043	0.203	0.028	0.166
Lower high school	0.326	0.468	0.298	0.458	0.332	0.471
High school	0.532	0.499	0.482	0.499	0.546	0.498
University or postgraduate	0.112	0.315	0.177	0.382	0.093	0.291
Marital Status						
Married	0.202	0.402	0.151	0.358	0.217	0.412
Previously married	0.027	0.162	0.022	0.146	0.028	0.166
Never married	0.771	0.42	0.828	0.378	0.755	0.43
Family Composition						
Partnered couple with children	0.658	0.474	0.691	0.462	0.649	0.477
Partnered couple without children	0.119	0.325	0.078	0.268	0.132	0.338
Single parent	0.105	0.307	0.119	0.324	0.102	0.302
No family unit	0.117	0.321	0.113	0.316	0.118	0.322
Industry						
Primary industry	0.033	0.178	0.087	0.282	0.017	0.131
Secondary industry	0.375	0.484	0.284	0.451	0.4	0.49
Tertiary industry	0.592	0.491	0.629	0.481	0.067	0.251
Occupation						
Business executive	0.006	0.074	0.006	0.077	0.005	0.073
Supervisor	0.022	0.146	0.026	0.158	0.021	0.143
White collar	0.422	0.494	0.409	0.491	0.425	0.494
Blue collar	0.551	0.497	0.559	0.497	0.548	0.498
Work Experience	0.058	0.235	0.0266	0.161	0.0675	0.251
Income	12031	5620	11537	5939	12172	5517
Macro-regions						
North	0.497	0.5	0.408	0.492	0.523	0.499
Centre	0.176	0.381	0.16	0.367	0.181	0.384
South	0.241	0.428	0.308	0.462	0.221	0.416
Islands	0.086	0.28	0.125	0.33	0.075	0.263
Past Health Status						
Injuries	0.97	0.171	0.972	0.164	0.9693	0.173
Financial support by family	0.049	0.216	0.121	0.327	0.028	0.165
N	8280		6640		1840	

Table 5: Socio-economic differences between the Italian macro-regions

	North	Centre	South	Islands
Variables		**% of the Sample**		
Temporary Job	18.21	20.27	28.37	32.21
Education				
Primary school	2.74	2.27	4.41	3.94
Lower high school	32.17	27.15	35.29	36.99
High school	52.27	61.03	50.03	51.48
University or postgraduate	12.82	9.55	10.28	7.59
Income Quantile				
1° (0-8000 Euros)	17.48	16.08	29.02	25.88
2° (8100-11000 Euros)	18.74	17.8	28.27	20.11
3°(11050-13000 Euros)	23.14	25.57	16.39	22.36
4° (13195-15000 Euros)	19.86	22.54	10.98	18.99
5° (>15000 Euros)	20.78	18.01	15.34	12.66
Average Income - Euros	12590	12480	10692	11629
(Std. Dev.)	(5545)	(4812)	(6122)	(5463)
Marital Status				
Married	19.86	18.69	21.35	22.08
Previously married	2.55	3.09	3.16	1.41
Never married	77.59	78.21	75.49	76.51
Family Composition				
Partnered couple with children	61.71	63.02	73.83	73
Partnered couple without children	14.88	11.41	7.57	8.58
Single parent	11.05	11.27	9.77	8.3
No family unit	12.36	14.3	8.82	10.13
N	(4119)	(1455)	(1995)	(711)
	49.75 %	17.57%	24.09%	8.59%

7 Results

7.1 Overall propensity score matching results

Table 6 presents the results for the average effect of the treatment on the treated (ATT). We show the results for the ATT using the three matching methods: Nearest Neighbour, Radius and Kernel Matching. The covariates (not included in the table but available on request) for the propensity score estimation showed that being employed by a temporary contract is positively related to being younger and female, having a higher education and a lower income. In terms of job characteristics, working as blue collar, in the primary industry, and living in southern regions are all positively associated with a temporary job position. All observed controls used in the propensity score matching analysis satisfied the balance property. When we split the sample between male and female the results remain very similar.

Starting from the full sample and with the first estimator we find that temporary employment has a significant and negative effect on the probability of enjoying well-being: in particular it decreases by 5 percentage points the probability of perceiving good health, by 6.8 percentage points the probability of being happy and decreases by 0.68 points the mental health score. Concerning mental health and happiness the results of Kernel and Radius Propensity Score matching show a similar picture, with a negative ATT around 5 percentage points for happiness and a decrease of the mental health score between 0.64 and 0.72. The fact that three estimates are almost identical is evidence of their robustness. Consistently with the previous literature, our analysis reveals a negative relationship between psychological well-being and having a temporary job (compared to having a permanent job) (see Robone et al., 2011). These effects are mainly driven by men. In fact, when analyzing the temporary job influence on health outcomes and happiness in particular, splitting the sample into males and females, the effect remains strong and statistically significant for men but not for women. The results are also much stronger and more consistent for mental health as opposed to physical health.

7.2 Propensity score matching results stratified by financial support

We further investigate the question of whether temporary contract effects on well-being, differ between young people who receive financial support from parents, and their counterparts who rely mainly on their employment as a main source of income.

The first two rows of Table 7 show the ATT for the group of young workers whose main source of income is employment while the second two rows include the ATT for those who receive financial support from their family. For the first group the ATT is similar to the baseline estimation: as before, having a temporary job compared to a permanent one seems to have adverse effects on psychological well-being and happiness, in particular for young male workers. The most interesting result arises from the group of young workers who are economically dependent on their parents. There is an asymmetry between women and men. While the effect of having a temporary contract is no longer statistically significant for men, young women who have a temporary job and who receive financial support from their family seem to enjoy good mental health compared to their permanent worker counterparts.

Table 6: Average treatment effects (ATT) of propensity score matching under nearest neighbour, radius and kernel methods

Nearest neighbour propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.051	-0.051	-0.054	-0.194	-0.488	-0.186	-0.680	-0.574	-0.625	-0.068	-0.056	-0.077
(0.024)**	(0.036)	(0.032)*	(0.178)	(0.284)*	(0.235)	(0.290)**	(0.479)	(0.355)*	(0.021)***	(0.033)*	(0.028)***

Full Sample N=8280 (Treated: 1840; Controls: 2844); Female N= 3565(Treated: 891; Controls:1196); Male N= 4715(Treated: 949; Controls:1631)

Radius propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.026	-0.014	-0.018	-0.018	0.013	-0.019	-0.719	-0.477	-0.654	-0.054	-0.030	-0.073
(0.018)	(0.026)	(0.025)	(0.142)	(0.216)	(0.187)	(0.218)***	(0.346)	(0.266)**	(0.016)***	(0.024)	(0.022)***

Full Sample N=8280 (Treated: 1840; Controls: 6359); Female N= 3565(Treated: 891; Controls: 2641); Male N= 4715(Treated: 949; Controls: 3685)

Kernel propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.039	-0.031	-0.044	-0.150	-0.187	-0.096	-0.643	-0.355	-0.808	-0.050	-0.029	-0.068
(0.017)**	(0.028)	(0.025)*	(0.149)	(0.244)	(0.174)	(0.217) ***	(0.342)	(0.267)***	(0.019)***	(0.025)	(0.022)***

Full Sample N=8280 (Treated: 1840; Controls: 6359); Female N= 3565(Treated: 891; Controls: 2642); Male N= 4715(Treated: 949; Controls: 3685)

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

Table 7: Average treatment effects (ATT) of propensity score matching with and without family financial support

Nearest neighbour propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.076	-0.050	-0.071	-0.443	-0.356	0.102	-0.608	-0.889	-1.060	-0.071	-0.050	-0.075
(0.025)***	(0.038)	(0.033)**	(0.187)**	(0.291)	(0.247)	(0.306)**	(0.498)*	(0.365)***	(0.022)***	(0.034)	(0.029)***
0.036	0.182	-0.031	0.274	-0.348	-0.804	1.364	5.645	0.219	0.035	0.224	0.188
(0.107)	(0.143)	(0.149)	(0.739)	(0.922)	(0.812)	(1.489)	(2.275)**	(1.549)	(0.101)	(0.139)	(0.144)

Job as Main Source of Income. Full Sample N=7843 (Treated: 1596; Controls: 2533); Female N= 3341 (Treated: 768; Controls:1065); Male N= 4502 (Treated:828; Controls: 3558)
Family as Main Source of Income. Full Sample N=406 (Treated: 224; Controls:104; Female N= 201 (Treated: 107; Controls:48); Male N= 195 (Treated:108; Controls:54)

Radius propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.023	-0.015	-0.013	-0.012	-0.026	0.028	-0.736	-0.569	-0.625	-0.060	-0.042	-0.074
(0.019)	(0.027)	(0.026)	(0.149)	(0.228)	(0.196)	(0.230)***	(0.365)	(0.283)**	(0.017)***	(0.025)*	(0.023)***
-0.047	-0.252	-0.094	-0.520	0.074	-0.725	0.663	3.760	-0.924	0.098	0.189	0.039
(0.069)	(0.729)	(0.095)	(0.508)	(0.100)	(0.726)	(0.907)	(1.510)**	(1.004)	(0.063)	(0.097)*	(0.084)

Job as Main Source of Income. Full Sample N=7843 (Treated: 1596; Controls: 6141); Female N= 3341 (Treated:768; Controls: 2533); Male N= 4502 (Treated:828; Controls: 1465)
Family as Main Source of Income. Full Sample N=406 (Treated: 224; Controls:180; Female N=201 (Treated: 107; Controls: 92); Male N= 195 (Treated:108; Controls:85)

Kernel propensity score matching (standard errors in parenthesis)

a) Self Assessed Health (SAH)			b) Physical Component Score (PCS)			c) Mental Component Score (MCS)			d) Happiness		
Full Sample	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**	**Full Sample**	**Female**	**Male**
-0.034	-0.029	-0.035	-0.131	-0.177	-0.067	-0.705	-0.486	-0.822	-0.054	-0.034	-0.070
(0.017) **	(0.028)	(0.024)	(0.177)	(0.205)	(0.147)	(0.264) ***	(0.374)	(0.241)***	(0.018)***	(0.027)	(0.026)***
-0.019	0.051	-0.106	-0.506	-0.062	-0.851	1.855	3.961	0.560	0.108	0.169	0.063
(0.091)	(0.106)	(0.144)	(0.552)	(0.834)	(0.870)	(1.103) *	(1.589)**	(1.472)	(0.068)	(0.095)*	(0.100)

Job as Main Source of Income. Full Sample N=7843 (Treated: 1596; Controls: 6141); Female N= 3341 (Treated: 768; Controls: 2533); Male N= 4502 (Treated: 828; Controls: 3358)
Family as Main Source of Income. Full Sample N=406 (Treated: 224; Controls:180; Female N= 201 (Treated: 107; Controls: 92; Male N= 195 (Treated:108; Controls:85)

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

It could be argued that Italy, as many other Southern European Countries (such as Greece and Spain) is characterized by a well-establish male work culture. Men tend to be focused on work and often have responsibility for being the main economic provider in a family; in this sense temporary jobs involve higher psychological distress and less happiness compared with permanent ones. On the other hand, women, who tend to take more time out for family responsibilities, may enjoy the favourable effect of non-traditional flexible work schedules which often characterize flexible jobs. Flexible schedules may give women the possibility of finding a more agreeable balance between working hours and time at home (Martens et al. 1999). Moreover, financial support available by parents may facilitate the combination of temporary employment and family responsibilities (Gonzalez, 2006).

8 Conclusions

Over the last decade the Italian job market has witnessed a relatively rapid liberalization process which has transformed both work relations as well as the dynamics regulating them. Atypical types of jobs, different from the usual permanent contracts, have become much more common. Flexible working conditions have been adopted throughout Europe, however in Italy the reforms have changed the job market substantially creating a kind of parallel market where the passage from the temporary contract to the permanent one remains uncertain, in particular for young people. Prior to the Biagi Reform, Italy had fairly low levels of job insecurity since job contracts were essentially permanent. This scenario has changed rapidly since between 1990 and 2008 Italy has been the European country with the highest level of growth in temporary job contracts. According to the ISTAT statistics in 2008, 18 million people had a "standard" contract (permanent full-time), approximately 2.6 million a part-time one and 2.8 million an atypical (temporary per project) one.

A few years on from the Biagi Law the Italian panorama is beginning to be enriched by the first empirical work on whether a temporary job represents an entrance into the permanent job market or whether it is a trap that leads to permanent precariousness. However, no studies have as yet examined the relationship between atypical job status and health. To the best of our knowledge our study is the first which analyzes the well-being consequences of fixed-term contracts and job insecurity among younger Italian employees and one of very few that considers several dimensions of individual well-being: physical health, mental health, self-assessed health and happiness. Moreover, the analysis of the effects of contractual conditions on both psychological and physical health, for both women and men, allows us to highlight interesting asymmetries in these effects. Consistently with previous literature, our analysis reveals a negative relationship between psychological well-being and having a temporary job (compared to having a permanent job). These effects are particularly relevant for men and much stronger for mental health than physical health. Also consistently with previous literature we find that workers with fixed-term contracts cannot be considered as a homogeneous group when comparing their health and well-being. There is an asymmetry between men and women in their response to job-related stress from temporary contracts depending on whether they receive financial support from their families. For men who depend primarily on their employment for income, job insecurity has a marked negative effect on their psychological health. For women who receive financial support from their families, job flexibility and temporary contracts have a significantly positive effect on their mental health.

The introduction in the Italian labour market of atypical job contracts has often been justified by the need for enterprises to ensure partial work flexibility and as an attempt to respond to youth unemployment. If, on one hand, the adoption of atypical contractual conditions, might have benefitted Italian enterprises, on the other hand, its consequences for the wider economy are questionable. Indeed, workers with deteriorated health and psychological well-being are likely to suffer more from illnesses limiting their working capacity and will impact on their work performance resulting in more sickness absence (Bartley et al. 2004). Policy makers, therefore, should consider the cost, both at a social and economic level, of the health limitations that might derive from temporary contractual conditions.

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Appendix

We describe here how the statistical matching between the ISTAT Multiscopo dataset with the Bank of Italy's Survey on Households Income and Wealth (SHIW) was performed. First, two constraints need be satisfied to make matching feasible: (i) the two surveys must be random samples from the same population; (ii) there must be a common set of conditioning variables. In our case, the first condition is met by design, since both the ISTAT Multiscopo 2005 and the SHIW 2004 data are representative of the Italian population. As far as the second constraint is concerned, the variables (X) common to each dataset and chosen for the process of imputation of the individual income, are: age, gender, macro-region of residence (North, South, Centre and Islands), marital status, education, professional position and field of work. Since working individuals have been taken into account, the final sample is made up of 49,402 observations from the SHIW survey and 14,460 from the ISTAT Multiscopo survey.

The dataset, integrated by ISTAT-Bank of Italy was created using the propensity score (PS) matching technique, a statistical method which allows individuals with similar characteristics but from different datasets to be put together (Rosenbau and Rubin, 1983). A "treatment" variable (T) has been generated, or rather defined as a binary variable that takes a value 1 if the interviewee belongs to the ISTAT Multiscopo Survey and 0 if the observation belongs to the SHIW survey. The PS or rather the probability of belonging to the ISTAT Multiscopo Survey conditioned by the set of common demographic and socio-economic variables, was calculated through a probit regression of the T variable of the X set of common variables mentioned above. Once that index was obtained it was necessary to define a similarity function between the individuals of the two samples. The similarity function assigns to each individual in the ISTAT Multiscopo set a similar individual from the SHIW, according to some particular criteria. The matching was performed through the most straightforward matching estimator: the nearest neighbour matching technique. The individual from the comparison group is chosen as a matching partner for a treated individual that is closest in terms of propensity score. This technique selects the comparison units whose propensity scores are closest to the treated unit in question (Caliendo e Kopeinig, 2005).

In order to obtain a more precise matching, the sample was stratified in cells according to type of occupation distinguishing between permanent and temporary jobs, and according to gender. The dataset was divided into 20 cells, for each of which a propensity score was calculated through a probit model.

Once the matching procedure was complete, it was evaluated in terms of maintaining the income distribution, both in terms of preserving the pre-existing income distribution as well as in terms of pre-existing relations between variables of interest. The next step was i) the comparison between the income distribution in the integrated dataset and the pre-existing SHIW one, ii) the calculation of the correlation between income and the X vector to verify the maintenance of the sign recorded in the "donor set". The differences between the common-fusion correlations in the SHIW data set versus the fused ISTAT Multiscopo data set were well preserved for most variables (see Table A1 and Table A2).

Table A1: Correlation between Income and X vector

Variables	ISTAT Multiscopo Survey (recipient set)	SHIW (donor set)
Age	0.0125	0.1125
Female	-0.0493	-0.0891
Region		
North	0.0115	0.0512
Centre	0.0027	0.0215
South	-0.0074	-0.046
Islands	-0.0123	-0.0545
Education		
No education certificate	-0.0815	-0.0189
Primary school	-0.1191	-0.1007
Lower high school	-0.1132	-0.1293
High school	0.0698	0.0576
University	0.1804	0.1597
Postgraduate	0.0571	0.0511
Occupation		
Business executive	0.3385	0.3616
Supervisor	0.3029	0.2533
White collar	0.3129	0.3108
Blue collar	0.0911	0.0117
Industry		
Primary industry	-0.1051	-0.1273
Secondary industry	0.0066	0.0126
Tertiary industry	0.058	0.0432

Table A2: Mean income in two datasets

Income Mean (standard deviation in parenthesis)	
ISTAT Multiscopo Survey (recipient set)	**SHIW (donor set)**
11652 (9504)	12493 (9357)